CLAIMS.

1. A method for detecting and locating a common signal within two input signals using correlation based techniques, comprising providing at least one filter by analysing the phase of the input signals in the frequency domain; filtering the input signals in the frequency domain using said at least one filter; and performing crosscorrelation of the filtered signals.

2. A method for detecting and locating leaks in a fluid carrying pipe using correlation based techniques, comprising: detecting two input signals from the fluid carrying pipe; analysing the phase of the input signals in the frequency domain to provide at least one filter; filtering the input signals in the frequency domain using the at least one filter; and performing crosscorrelation of the filtered signals.

3. A method according to claim 1 or 2, wherein the signals are audio signals.

4. A method according to any preceding claim, wherein the at least one filter includes a first filter for suppressing frequencies which do not exhibit a sufficient degree of coherence.

5. A method according to claim 4, wherein the first filter is constructed using a method comprising: selecting at least one section from each of the two input signals; calculating the Fourier Transform for each section; calculating the average vector sum of the phase difference between the two input signals

for each of a plurality of frequencies; and calculating the magnitude of the vector sum for each frequency.

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6. A method according to any preceding claim, wherein the at least one filter includes a second filter for identifying regions in the frequency spectrum of a crosscorrelation function likely to exhibit a correlated phase between adjacent frequencies in its Fourier Transform.

7. A method according to claim 6, wherein the second filter is constructed using a method comprising: selecting at least one section from each of the two input signals; calculating the Fourier Transform for each section; calculating the average vector sum of the phase difference between the two input signals for each of a plurality of frequencies; and calculating the magnitude of the vector sum for each frequency.

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8. A method according to claim 6 or 7, including calculating the time delay between the common signal in the inout signals by tracking the phase difference between the input signals as a function of frequency using the second filter.

9. A method according to any of claims 6 to 8, including calculating variations in the time delay between the common signal in the input signals as a function of frequency using the second filter.

10. A method according to any preceding claim, including using a third filter to remove frequencies which do not have sufficient amplitude.

11. A method according to claim 10, wherein the third filter is constructed using a method comprising: applying a digital threshold to the product of the spectra of the two input signals.

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12. A method according to any preceding claim, wherein the at least one filter includes a fourth filter for compensating the input signals for dispersion effects.

13. Apparatus for detecting and locating a common signal within two input signals using correlation based techniques, comprising a computer including: means for providing at least one filter by analysing the phase of the input signals in the frequency domain; means for filtering the input signals in the frequency domain using said at least one filter; and means for performing crosscorrelation of the filtered signals.

14. Apparatus for detecting and locating leaks in a fluid carrying pipe using correlation based techniques, comprising: detectors for detecting two input signals from the fluid carrying pipe; a computer including means for analysing the phase of the input signals in the frequency domain to provide at least one filter; means for filtering the input signals in the frequency domain using the at least one filter; and means for performing crosscorrelation of the filtered signals.

Subj A5 cont

15. Apparatus according to claim 13 or 14, wherein the signals are audio signals.

Sub A5 End

16. Apparatus according to any of claims 13 to 15, wherein the at least one filter includes a first filter for suppressing frequencies which do not exhibit a sufficient degree of coherence.

17. Apparatus according to claim 16, wherein the first filter is constructed using a method comprising: selecting at least one section from each of the two input signals; calculating the Fourier Transform for each section; calculating the average vector sum of the phase difference between the two input signals for each of a plurality of frequencies; and calculating the magnitude of the vector sum for each frequency.

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18. An apparatus according to any of claims 13 to 17, wherein the at least one filter includes a second filter for identifying regions in the frequency spectrum of a crosscorrelation function likely to exhibit a correlated phase between adjacent frequencies in its Fourier Transform.

19. An apparatus according to claim 18, wherein the second filter is constructed using a method comprising: selecting at least one section from each of the two input signals; calculating the Fourier Transform for each section; calculating the average vector sum of the phase difference between the two input signals for each of a plurality of frequencies; and calculating the magnitude of the vector sum for each frequency.

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20. An apparatus according to claim 18 or 19, including calculating the time delay between the common signal in the inout signals by tracking the phase difference between the input signals as a function of frequency using the second filter.

Subj A7 end

21. An apparatus according to any of claims 18 to 20, including calculating variations in the time delay between the common signal in the input signals as a function of frequency using the second filter.

22. Apparatus according to any of claims 13 to 21, including a third filter to remove frequencies which do not have sufficient amplitude.

23. Apparatus according to claim 22, wherein the third filter is constructed using a method comprising: applying a digital threshold to the product of the spectra of the two input signals.

Subj A8

24. Apparatus according to any of claims 13 to 23, wherein the at least one filter includes a fourth filter for compensating the input signals for dispersion effects.